SOME RECENT DANISH MEDICO-HISTORICAL WRITINGS.[1]

DURING the last few years there has been a widespread revival of the study of medical history in many countries, and a considerable number of professorships have been founded to teach a branch of the curriculum which is considered by many to be invaluable from an educational point of view. Some medico-historical societies have also arisen in France, America, and England, and, judging by their literary output, work is going on very actively. The small but highly intellectual country of Denmark is not behind the others, as is seen in the issue, under the direction of Prof. Vilhelm Maar, of the University of Copenhagen, of an important series of small monographs which we have before us. Up to the present fourteen of these have been published and cover a wide field of medical historical research. They are the work mostly of Danes, chiefly of the University of Copenhagen.

Thus Finnur Jónsson (1), professor of Northern philology, gives an interesting account of various diseases in northern Scandinavia and Iceland in ancient times, of particular importance being his statements as to the wide geographical distribution of leprosy, small-pox, pulmonary and mental diseases. There would appear to be no records of syphilis, and, indeed, venereal diseases generally were but little known.

Kristian Carøe (2) has written a short account of the relation of the medieval bedell to medicine, and in particular to the practice of surgery. The exposition of the doctrines on the origin of mental diseases in the classical period has been ably carried out by Dr. J. L. Heiberg (3). Dr. Ernest Wickersheimer (4), the well-known librarian of the Academy of Medicine in Paris, continues the studies on the treatment of hydrophobia by sea-water which he had published some years previously. A very exhaustive account of trephining in primitive times comes from the pen of Dr. Søren Hansen (5), and is well illustrated. Ample justice is done to the fairly extensive literature extant on the subject. Dr. K. K. K. Lundsgaard (6) deals with the well-worn theme of the history of spectacles and eye-glasses, and brings the facts well up to date. In the seventh brochure Dr. J. W. S. Johnsson writes with knowledge and humour on medieval quacks and their advertisements.

Chr. Barfoed (8), in the compass of eighty-eight pages, has managed to dig deeply into the question of the laying on of hands in its religious and therapeutic aspects from ancient to modern times. The practice of the royal touch in England from Edward the Confessor to Queen Anne is dealt with at some length. Charles II. seems to have carried out this royal duty with great assiduity, for, at the rate of 3700 a year, he touched 92,102 sick persons between 1660 and 1682. After George I. the practice fell into disrepute in England. The relationship of "laying on" to Christian Science and its extraordinary modern dissemination is also dealt with.

Carl Jul. Salomonsen (9), the eminent professor of general pathology in Copenhagen, deals in his own characteristic way with the island of Cos and the home of Hippocrates, basing his work on the remarkably successful excavations carried out by Rudolf Herzog in 1902, which have added immensely to our knowledge of this insular home of the medical art.

One of the largest of Prof. Maar's series is a translation of Felix Platter's autobiographical reminiscences of his youth (10 and 11). Platter, as is well known, was one of a medical family of the name who added great lustre to the town of Basel in the Middle Ages. He himself was in practice there for a large part of the sixteenth century, and after his return from Montpellier was one of the first to dissect the human body and to teach the Vesalian anatomy. His autobiography, including as it does his journey to Montpellier and his study there, is an important contribution to the history of the time of the Reformation.

Of less purely medical interest is Axel Garboe's (12) work on unicorns and their relation to existing animals like the narwhal. Dr. Julius Wiberg (13) gives an elaborate account of the doctrines held among the ancients as to the causes, onset, and termination of crises and critical days in diseases—a subject which modern medicine has not yet unravelled in its entirety. The series closes with a small book by the late Prof. Ingerslev (14) on Dr. Ambrose Rode, a German doctor who practised first in Copenhagen and then in Christiania in the seventeenth century.

Prof. Maar is to be congratulated on having gathered together such an interesting amount of original material, and when more peaceful times come again it is to be hoped that he will be able to keep the historical flame burning in that small Scandinavian country to which we are bound by so many ties over so many centuries.

W. B.

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[1] "Medicinsk-historiske Smaaskrifter." Ved Vilhelm Maar. (København: Vilhelm Trydes Forlag.) (1) Finnur Jónsson: "Laegekunsten i den nordiske Oldtid": 1912. (2) Kristian Carøe: "Bøddel og Kirurg"; 1912. (3) J. L. Heiberg: "Sindssygdom i den classiske Oldtid"; 1913. (4) Ernest Wickersheimer: "Hundegalskab og Strandbade"; 1913. (5) Søren Hansen: "Primitiv Trepanation": 1913. (6) K. K. K. Lundsgaard: "Brillernes Historie"; 1913. (7) J. W. S. Johnsson: "Lidt om landefarernes og laegernes Reklame i Ældretid"; 1914. (8) Chr. Barfoed: "Haandspaalaeggelse"; 1914. (9) Carl Jul. Salomonsen: "Asklepios' Helligdom på Kos"; 1914. (10 and 11) "Felix Platters Ungdomserindringer, skildringer fra Basel og Montpellier i Reformationstiden, oversatte og udgivne af Thora Gertz"; 1915. (12) Axel Garboe: "Enhjørningen"; 1915. (13) Jul. Wiberg: "Kriselaeren i oldtidens Medicin": 1916. (14) E. Ingerslev: "Ambrosius Rhodius og hans Hustru": 1916.

NOTES.

ACCORDING to the *Chemist and Druggist*, Prof. E. Buchner, director of the Chemical Institute of Würzburg University, and Nobel Laureate in chemistry for 1907, has been killed in action on the Western front.

SENOR AUGUSTO VILLANUEVA, Banco de Chile, Santiago de Chile, has accepted the position of representative and corresponding member of the Ramsay Memorial Committee for Chile, and is taking steps to promote the objects of the memorial in Chile by the formation of a local committee and in other ways. The Ramsay Memorial Fund now amounts to

21,428*l*. 11*s*. 6*d*. Further donations can be sent to the honorary treasurers, Lord Glenconner and Prof. Collie, at University College, London (Gower Street, W.C.1).

THE Martell scholarship of the Institution of Naval Architects, which is of the annual value of 100*l*. and, subject to the regulations, tenable for three years, has been awarded to Mr. H. C. Carey, of Chatham Dockyard. The Earl of Durham prize of the same institution has been awarded to Mr. H. D. Leggett, of Portsmouth Dockyard.

WE learn from the *Scientific American* that a series of handbooks is to be published by the U.S. Geological Survey giving for the various military divisions of the country, in a compact form, information relating to their physical features, leading industries, transportation lines, and other matters of interest to the Army. The preparation and editing of the volumes have been entrusted to the committee on physiography of the U.S. Geological Survey.

ACCORDING to a report in *L'Echo du Commerce* for August 18, certain tests which were made some time ago with a view to the use of fuel made from olive residues gave such satisfactory results that the Tunisian Government, which has already commenced manufacturing the fuel in the form of briquettes, is about to increase its production. A tramway company and other important firms will use this fuel in their electric power stations.

WE regret to learn that 2nd Lieut. H. L. Foster, of the Royal West Kent Regiment, was killed on June 7. Mr. Foster was the son of the most distinguished horticulturist of his time, the late Mr. Charles Foster, who was for some years the head of the Horticultural Department of University College, Reading. He was educated at the Reading Collegiate School, and underwent the horticultural training at the Royal Horticultural Society School at Wisley. He was appointed assistant horticultural instructor under the Kent Education Committee, 1913, an appointment which he held until September, 1914, when he joined his Majesty's Forces. He obtained a commission in 1916, after having been severely wounded at the battle of Loos. Although still young, Mr. Foster proved himself one of the most promising of the younger horticulturists, and his death is a severe loss to the world of horticulture.

DR. J. R. TOSH, lately assistant professor and lecturer on zoology in St. Andrews University, has fallen (July) in Mesopotamia from "heat-stroke," when gallantly doing his duty. Dr. Tosh was a distinguished student, and after graduating in arts devoted himself, as became one in touch with the Dundee Museum from boyhood, to zoology. He carried out, very early in his career, fisheries' work at the old St. Andrews Marine Laboratory, and further developed a great aptitude for teaching. He then became a science teacher in schools, and carried out various researches, such as the investigation on the salmon of the Tweed, for the Fishery Board, making at the same time a collection of its parasites for a subsequent notice. He also studied the development, life-history, and economic aspects of the pearl shells. Later he was appointed marine zoologist to the Queensland Government, with special reference to the pearling industry, and he did much good work on Thursday Island. When he returned in 1905 he was made assistant professor and lecturer in his *alma mater*, and ably performed for nine years the duties as a popular demonstrator, skilled in all the modern technique and a great favourite with the students. He returned again to Australia to develop the pearling industry on lines of his own, coming home just as the war broke out to form a company on the basis he had outlined, but the absorbing interest in the war arrested progress. He then joined the field forces, and was suddenly cut off as mentioned, to the loss of science and the pearling industry.

MR. DONALD MACLENNAN, whose death was announced in NATURE of August 30, laid the foundation of a very profound knowledge of the shorthorn and other breeds in the Black Isle district of Ross-shire. Failing to make both ends meet in his native land, he emigrated in 1871 to the Argentine. Having made a small fortune as a stockman, he decided in 1881 to return to Scotland, with the view of paying off his debts and thereafter devoting his life to improving the hitherto neglected native Argentine cattle. About 1867 steps were taken to raise the standard of the scrub cattle of Texas, Colorado, and other North American States, with the result that for some twenty years the breeding of improved types of cattle was a great industry in the south-western and western States of the Union. But in course of time cattle ranges practically disappeared in North America. Thanks largely to Maclennan, as cattle ranges disappeared in the United States, improved breeds of cattle made their appearance in the Argentine. But for this the supply of sufficient meat for the Army in France and for home consumption would have been extremely difficult. In July the wholesale price of the best class of Argentine beef was 3½*d*. per lb., *i.e.* 1½*d*. less than in New South Wales. Maclennan thoroughly realised the kind of animals required to improve the descendants of the cattle originally introduced into South America by the Spaniards. He trusted more to make and performance than pedigree, and being extremely conscientious, he was trusted by the Argentine breeders, and so completely gained the respect and admiration of British stockmen and others he had dealings with that at a memorable gathering at Perth in 1914 Lord Lovat, in the name of his many friends, presented him with his portrait.

FEW Augusts of recent years have been so unsummer-like as the month which has just closed, and the weather conditions were almost continuously rainy and cool, whilst the winds have been stormy, amounting at times to the full force of a gale. During the latter half of the month cyclonic disturbances traversed Great Britain almost daily, the wind incessantly backing and veering through south and west. At South Kensington, the observing station of the Meteorological Office, the highest temperatures observed throughout the month were 77° on August 23 and 75° on August 7. On some days towards the close of the month the thermometer at the health resorts failed to touch 60°, even at Hastings, Falmouth, and Bournemouth. The *Times* of August 31 and September 3 gives an account of a dull and wet August. It states that the month had an excessive rainfall over the whole country, the rain measurements being almost as heavy as in 1912, the wettest August on record. In many parts of England and Ireland the aggregate rainfall for the month amounted to more than double, and at some places in the west to nearly three times, the average. At the headquarters of the British Rainfall Organisation in Camden Square the total of 3·99 in. was not so large as in the August of last year, but at Kew Observatory the total of 4·08 in. was larger than in any August since 1912, or, with that exception, since 1881. At Wandsworth Common the total of 4·66 in. was more than double the average, and was larger than anything recorded since 1912, although it was not quite so large as in the August of 1903. The highest temperatures are said to have occurred in Scotland and the north of England, where at the close of the first week the thermometer exceeded 80°, registering 84° at Nairn. At Kew the highest temperature was 75°, and at Hampstead 73°. Temperature is said to have been much more favourable than in August, 1912, when the thermometer failed to rise above 70° at any but a few scattered places in England, and at many places in the northern and western districts it failed to exceed 65°.

Symons's Meteorological Magazine for August contains a short account of the unusually heavy and persistent rain in the south-east of England between July 29 and August 4. In London the rainfall for the six days amounted to 3·78 in. More than 7 in. fell at a number of places: at Canterbury (St. Thomas Hill) the measurement was 10·31 in.; at Maidstone 8·09 in.; at Kingston Rectory 7·51 in.; at Teynham, Kent, 7·32 in.; and at Margate 7·05 in. These amounts are in many cases said to have been quite unprecedented. In the three days, from July 30 to August 1, the rainfall measured 6·18 in. at Maidstone, 5·82 in. at Canterbury, and 5·58 in. at Meopham. A more detailed account is promised in "British Rainfall, 1917." In July the rainfall over the whole of the British Isles was only 69 per cent. of the average; in England and Wales it was 76 per cent. Correlations of the several meteorological elements are being studied with the view of securing long-period forecasts, and the magazine contains a short account of correlations between the temperature at South Orkneys and the rainfall in the Argentine Republic, by N. A. Hessling. With two years' interval between the temperature and the rainfall the correlation is negative, whilst with three and a half years' interval the correlation is positive. It is suggested that the negative correlation may be explained by the annual ice, and the positive correlation by ice which has broken away from the permanent ice-barrier, the greater thickness of this ice explaining the longer interval. Similar reasoning is followed for correlations between temperature at Stykkisholm in Iceland and Jacobshavn in Greenland and the rainfall at Albany, N.Y., with two years' interval; there are also similar correlations for Paris, Greenwich, and Ponta Delgada.

IN the *Times* for August 27 Dr. Andrade continues the discussion on the sound of gunfire introduced by Mr. Sleggs's letter (see NATURE for August 23, p. 513). Referring to the work of Prof. Mach and more recent writers, he remarks that "the sound produced by a high-velocity gun, as heard in front of the piece, is double, consisting of a sharp crack, which is very distressing to the ear, followed at an interval (which for the 60-pounder may be two or three seconds if the listener is in the line of fire) by a dull boom, which is the true sound of the firing of the piece. This boom is a much duller and heavier sound, which shakes buildings, but does not hurt the ear. The sharp crack is not produced by the gun directly, but by the shell during its flight, and then only if the initial velocity of the shell exceeds that of sound, as is the case with all modern guns. . . . The interval between the two sounds is greatest in the line of fire; as one walks to a flank it becomes less and less, until finally only one sound, that of the gun itself, is heard, the same sound that is heard behind the gun. The zone within which the double sound is heard is bounded by lines from the gun, making an angle of somewhere about 45°–65° on either side the line of fire, varying with the initial velocity of the shell and also with the angle of elevation at which it is fired." Dr. Andrade points out that this shell-wave accounts for the fact that for an observer some distance in front of the batteries taking part in a bombardment the noise is much more trying to the ear than for one an equal distance to the rear of the batteries, quite apart from the noise of the enemies' guns. Owing to the shell-wave being directed, and also originated, in the air well above such obstacles as trees and houses, it carries farther than the gun-wave, and is often the only sound heard of the enemies' guns, the true noise of the discharge of the piece being lost if the gun is far back behind the enemies' lines.

IN his paper on "Masks and Acting," published as No. 7 of Occasional Publications of the Classical Association, Dr. F. B. Jevons remarks that while of late years classical scholars, both of Oxford and Cambridge, have paid increasing attention to anthropology as well as to the classics, it is surprising how little discussion has been devoted to the possibility that there may be some connection between the use of masks in the performance of savage mysteries and in the performance of the Greek drama. Outside Europe masks and acting are part of the commemoration of the dead, and also form an element in the worship both of vegetation spirits and of theriomorphic spirits. A presumption is thus raised that similar rites were used in Greece, and that these three types of observances eventually gave rise to tragedy, comedy, and the satyric drama. This is corroborated by the mummers' plays of England and modern Greece, and if the conjecture be accepted, these mummers' plays spring from the same source as did Greek comedy, and, like it, inherit their masks and acting from prehistoric times.

THE Journal of the Gypsy Lore Society now appears (vol. viii., part 3) after unavoidable delay caused by the war. The chief contribution to this number is a paper on "English Gypsy Folk-tales and other Traditional Stories," collected by Mr. T. W. Thompson, who by long intercourse with branches of the tribe has acquired a remarkable familiarity with their manners and customs. Many gipsy folk-tales have already been collected by Campbell, Groome, Sampson, Leland, Hall, and others, and the material seemed to have been fully gathered. Mr. Thompson has now discovered some old gipsies who possess a hitherto unknown stock of traditions, and during six months he recorded no fewer than sixty märchen, drolls, and lying tales hitherto unknown. From the instalment of his collection now published he is perhaps inclined to over-estimate the value of this new material, many of the tales being little more than trivial anecdotes. But there is much of substantial value, such as the fine tragical story of "The Robber and the Housekeeper" and a gipsy version of "Jack and the Beanstalk." Mr. Thompson appeals to students of folk-tales for assistance in collecting parallels to the incidents with a view to the publication of the entire collection at a future time.

IN the *Veterinary Review* for August (vol. i., No. 3) Capt. Frank Chambers, A.V.C., states that evidence has been obtained that animal trypanosomiasis can be and is spread in tsetse-free areas by the agency of biting flies, of which the Tabanidæ are the worst offenders. This number also contains a further series of abstracts of papers, which is such a valuable feature of this journal.

AN address to nurses delivered by Dr. Mercier to the nursing staff of The Retreat at York in 1909 has been issued in booklet form ("The Ideal Nurse," The Mental Culture Enterprise, 329 High Holborn, W.C.1, price 1*s*. 3*d*. net.). While written primarily for the mental nurse, it contains a number of hints and suggestions which would be of value to any nurse, and these are presented to the reader in an attractive form.

THE *Brooklyn Museum Quarterly* for April, which has just reached us, contains a brief but interesting account of the nesting habits of the Sooty albatross of South Georgia by Mr. R. C. Murphy. During a four months' stay in South Georgia Mr. Murphy found plenty of nests of these birds, though all but three were inaccessible, being placed on the ledges of unscalable cliffs, sometimes as much as 700 ft. up. In one nest which he examined he found a male brooding a downy chick, and succeeded in photographing both. The coloration of the head of the latter is conspicuously different from that of the adult, and recalls that of the Emperor penguin. This particular family was brought back, and is now mounted in the Brooklyn Museum. Judging from the photograph given of this group, it does not excel as an example of the taxidermist's art.

THE forty-eighth annual report of the trustees of the American Museum of Natural History for 1916 has just been issued. Beautifully illustrated and admirably compiled, it is certain to arouse considerable interest among those concerned with the management of museums all the world over. In spite of the war, we are glad to note, the trustees have decided to proceed with their scheme for the addition of a new wing, which is to be called the Court of Ocean Life, and it is to be "the most complete and beautiful museum unit in the world." It is to include a "Hall of Fishes," a great whale gallery, a gallery for the reptiles of the world, and above this a "Hall of Dinosaurs." The building is planned, in short, on the lines of the famous Oceanographic Museum at Monaco. Since, owing to the war, public funds are not available for this great work, the trustees have appealed to the generosity of the public, who, as usual, have responded promptly and liberally. But a sum of 400,000 dollars yet remains to be collected to complete the 1,000,000 dollars which must be raised to complete the work.

A BRIEF but most admirable memoir of the gorilla which died lately in the Dublin Zoological Gardens is given by Prof. G. H. Carpenter in the *Irish Naturalist* for August. This animal, a female, lived in the gardens three years and four months, the longest period through which a gorilla has survived in captivity in the United Kingdom. Though less interesting and friendly than most of the chimpanzees which have lived in Phœnix Park, "Empress" was always docile, but she resented any attempt at nursing or being carried about, even by her keeper. But she showed a great affection for a young male chimpanzee, which was her constant companion. For a brief space, while the chimpanzee was unwell, she displayed great anxiety, and tried to nurse him as though he were a sick child, pillowing his head on her body. During her games with "Charlie" she was in the habit of drumming with her fists on her breast, as a kind of challenge. She not only rarely lost her temper with him, but indeed showed towards him something like subservience, even giving up, without protest, food that he was greedy enough to covet. But she was always less active than her fellow-captive, and could never be induced to leave her cage with him for a ramble, though all kinds of inducements were held out to her to do so. The length of life in captivity attained by the Dublin specimen seems to have been exceeded only by the female which lived in the Zoological Gardens at Breslau nearly seven years. Three most excellent photographs add greatly to the value of this history.

AFTER five months' suspension, we are glad to receive the second number of the *Kew Bulletin* for this year. This number is mainly occupied by a careful revision of the difficult fungus genus Phomopsis, which has long been imperfectly known, and the present account, by Mr. W. B. Grove, which deals with the British species, will be of great value to mycologists, both in this country and in the United States. A second article, on "Tree Labels at Kew," gives a detailed description of the treatment of the descriptive card labels, by celluloid varnish, for the purpose of resisting exposure to weather and also of avoiding the use of glass.

IN his address on the social, educational, and scientific value of botanic gardens, delivered at the dedication of the laboratory building and plant-houses of the Brooklyn Botanic Garden on April 19, 1917, Prof. J. M. Coulter made some interesting remarks on fundamental and practical science, the two phases sometimes referred to as pure and applied science. With reference to the general impression that pure science holds no relation to public welfare, and that applied science serves our needs, Prof. Coulter points out that only by pure science is applied science kept alive and progress made possible. To neglect the former would be like wanting children and eliminating parents, or like some "practical" men who would praise the practical electric light and forget the unpractical, because unseen, power-house. To this power-house may be likened scientific research, which generates the energy we apply in developing what may be called the machinery of our civilisation.

IN a report on the work of the Imperial Institute presented to the new Executive Council, some account is given of the investigations that have been completed into the composition value and commercial prospects of a variety of raw materials derived from some twenty-four countries in the Overseas Empire. In Egypt flax-growing is being extended, and a sample of flax straw has been valued in Belfast at from 200*l*.–220*l*. per ton. In normal times such flax would be worth 60*l*. per ton. In Seychelles, ajowan, *Carum copticum,* and the mosquito plant are being cultivated with success as sources of antiseptic thymol, which used to be imported into this country from Germany. Another matter of interest relates to the important clove industry of Zanzibar and Pemba, whence last year a record crop of cloves was obtained. In recent years the trees have been attacked by a disease which could not be traced to any fungus or insect pest; and it has now been found, as a result of an examination at the Imperial Institute, that the soils in which the affected trees were growing have become acid and deficient in lime and phosphates, through neglect of proper cultivation, and appropriate remedial measures have been suggested for trial.

OF modern contributors to Italian scientific and general literature, probably few have shown so much versatility as Aldo Mieli. A list of Mieli's writings, dealing with the period 1906–16, has now been published (Florence: Libreria della Voce, 1917, pp. 64). Born at Leghorn on December 4, 1879, Mieli graduated at Pisa in chemistry in 1904. He afterwards studied under Ostwald, and assisted in the department of chemistry at the University of Rome, obtaining the rank of *privatdozent* in 1908. He acted as chief editor of the *Rivista scientifico-industriale* of Florence during part of the years 1907–9, and was also editor of the Italian section of the Belgian periodical, *Isis,* suspended at the outbreak of war. In addition, he edited the natural science section of the *Rivista per la storia critica delle scienze mediche e naturali,* as well as a series of "Classics of Science and Philosophy," published at Bari (Società tipografica editrice barese). He also wrote a large number of papers, as well as book reviews, for the leading Italian scientific journals, and a list of these is included in the pamphlet before us. Among the subjects dealt with are chemistry, physics, history of science, including Roman and Greek history, politics, philosophy, and music.

METEOROLOGISTS and physicists who are interested in the subject of globular lightning will find two papers by Prof. Ignazio Galli, published by the Pontificia Accademia Romana dei Nuovi Lincei in 1916 and during the present year, of great value. The phenomena present themselves under such varied guise that some physicists are inclined to doubt altogether their actual existence, preferring to regard what is seen as the result of an optical illusion produced by the light of the discharge. Prof. Galli, in addition to an historical account of older references to the subject, going back to classical times, has collected from the appropriate scientific literature a large number of modern observations. These are well classified according to the various appearances presented and will form a very convenient source for comparison and reference. The writer of this note may, perhaps, be allowed to put on record an observation of his own. Some years ago, when driving with a friend, he was overtaken by a violent thunderstorm accompanied by torrents of rain. When the storm was at its worst a vivid flash of lightning was immediately followed by a terrific clap of thunder; on looking up against the driving rain each of us saw, on a small hill about half a mile in advance, a luminous globe the angular diameter of which was rather less than that of the moon, and the colour of which was that of the positive glow in a carbon dioxide vacuum tube. This persisted for nearly five seconds and then suddenly disappeared.

MR. LEO WALLERSTEIN is the author of an interesting and comprehensive paper entitled "Enzymes in the Fermentation Industries" in the Journal of the Franklin Institute for May and June. A general outline is given of the wide field over which enzyme activity ranges, from the decomposition of urea by urease to the coagulation of the blood by thrombase on exposure to air. Stress is laid on the conditions characteristic of optimum enzyme activity, viz. the specificity of enzymes, the importance of temperature and reaction of the solutions in which they act, and their colloidal nature. It is pointed out that enzymes, although of importance industrially mainly as decomposing agents, are naturally of equal importance synthetically, as they serve to build up the tissues of the animal body and of plants. Mr. Wallerstein gives a detailed account of the brewing process from the point of view of the enzymes concerned. In the malting of the barley grain the reserve food material of the endosperm is rendered available by the oxydase, amylase, protease, etc., secreted by the embryo. In the mash-tun the starch is degraded to maltose and dextrin by the action of the amylase, whilst the proteases effect changes in the proteins present. Finally, in the fermentation of the sterile wort with yeast the chief enzyme action is the decomposition of the sugar into alcohol and carbon dioxide by means of zymase. It was discovered by the author that beer can be made chill-proof (when kept on ice beer becomes cloudy, owing to separation of protein matter) by addition of a very small proportion of pepsin to the sterilised wort. The power of the yeast cell when provided with sugar, ammonium sulphate, and inorganic salts to synthesise albumen has been employed in Germany, where large quantities of yeast are so prepared and used as a cattle food.

IT is more than seven years since the date of the last disastrous flood which inundated Paris and left a record in height surpassing anything since the year 1658. Although the intervals between the graver visitations of this kind seem to be increasing, yet the Parisians have not failed to recognise the inevitability of their recurrence and the necessity of preparation for them. Shortly after the floods of January, 1910, a commission was appointed for the purpose, under the presidency of the late M. Picard, and a few months later a report was issued containing its recommendations. Some of these have already been carried into effect, but the more important are still under consideration, partly on account of their magnitude and cost, and partly on account of the war. In January last year the French Government brought forward legislative proposals, which included the widening of La Monnaie channel in Paris itself and the deepening of the Seine between Suresnes and Bougival, at a total estimated cost of 67,346,000 francs, or nearly 2,700,000*l*. A deviation of the Marne, by means of a canal from Annet to Epinay, though recommended by the commission, is not regarded at the moment as a feasible proposition. It is calculated that the works proposed to be carried out will effect a lowering in flood height of rather less than half a metre, say 18 in. The period required for their execution is at least seven years. Operations will involve the moving of a section of the Paris-Orleans Railway and the building of a new quay wall opposite the Cathedral of Notre Dame. We are indebted for these particulars to an article in the *Engineer* of July 6.

THE *Times Engineering Supplement* for August 31 contains an account of the Australian Transcontinental Railway, which is now practically completed. This railway runs from west to east, and for the first time puts Western Australia in direct railway communication with the other States in the Commonwealth. It will reduce by two or three days the time required by passengers and mails to travel between Great Britain and the eastern States of Australia. Among other advantages, it will tap the resources of a stretch of country having great productive possibilities, and it also possesses strategic importance. The line runs from Kalgoorlie, in Western Australia, to Port Augusta, in South Australia—a distance of about 1051 miles, and its course is roughly parallel to the coast of the Great Australian Bight, but always well away from it. The highest elevation attained is 1354 ft. The standard gauge of 4 ft. 8½ in. is adopted. The railway is designed for high-speed running, and when the ballasting is complete the journey between Kalgoorlie and Port Augusta should be made in about twenty-four hours.

UNTIL quite recently the semi-Diesel, or hot-bulb, type of oil engine for marine purposes was considered to be suitable for comparatively small powers per cylinder. Recent modifications in design have brought this type into favour for powers up to 130 brake-horse-power per cylinder. The Beardmore engine—described in *Engineering* for August 24—has four cylinders, each 11 in. diameter by 15-in. stroke; working on the two-stroke cycle, it develops 160 brake-horse-power at 280 revs. per min. It is particularly suited to consume fuels ranging from 0·8 to 0·9 specific gravity, but can be adjusted to use either slightly lighter or heavier oils. The low speed of revolution is conducive to high propeller efficiency. The engine is directly reversible by means of compressed air, and requires no disconnecting clutch between the engine and the propeller. For a typical British coaster, 75 ft. long, the 160 brake-horse-power engine weighs 145 cwt.; the weight of the complete installation, including fuel tanks, floor plates, pipes, etc., is 14 tons, and the engine-room bulkheads are 15 ft. apart. One thousand gallons of fuel can be carried, and this quantity gives the vessel an acting radius of 750 nautical miles.